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Abstract

ERECTION, TESTING AND OPERATION OF THE RADIOISOTOPE PRODUCTION FACILITY OF THE UAR AEE

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A general description of this project has been presented to the IAEA symposium on Programming and Utilisation of Research Reactors held in Vienna, October 1961. Construction of this facility has been completed in July 1962 and was followed by extensive testing till its commissioning on 23 December 1962, after which routine operation and distribution continued regularly till to date. This laboratory has been the result of the fruitful co-operation between the U.A.R. A.E.E. and the Norwegian firm NORATOM, under an Agreement of co-operation between U.A.R. A.E.E. and I.F.A. on the Peaceful Applications of Atomic Energy.

The radioisotope production laboratory includes facilities for the routine production of I^{131} (1c per batch in each of two boxes), Au^{198} (colloidal and Muller types, 5c each per batch), Na^{24} (50 mc per batch), K^{42} (2c per batch), P^{32} (500 mc per batch), S^{35} (500 mc per batch) and Cr^{51} (500 mc per batch). It also includes other general hot facilities for research and development as well as various facilities for control of production. The present report deals with the main lines of experience gained in erection, testing and operation of the radioisotope production laboratory, as well as with the main lines of development.

The construction stage gave valuable experience to various engineers and skilled workers in erection of hot cells and production boxes and ventilation, monitoring and radioactive waste systems. The main experience in this connection is the absolute necessity of intimate co-ordination and co-operation of the various engineering groups, both in planning and in realization.

On completion of construction, testing was carried out on two stages as follows:

(a) Testing of the different individual apparatus and equipment, followed by testing of the complete technological system, ventilation, waste, etc.

(b) Testing of the production processes themselves starting with inactive runs, followed by low activity production till full capacity tests. All medical products have been subjected to strict radiochemical, spectrochemical and biological control, and proved suitable for medical distribution.

Consequently, regular production has been carried out, which satisfied all the nedds of the U.A.R. from these isotopes, as well as the demands of the Middle East Regional Radioisotope Training Centre for the Arab Countries. Although the laboratory production capacity is much higher than the actual production during this initial running-in-period, yet the distribution dates indicate a general trend of increase in the application of these isotopes in the U.A.R.

In parallel with the regular production, radiography sources of Co^{60} and Ir^{192} have been produced on demand and a development programme has been undertaken in co-operation with Dr. Micheev. For production of colloidal solutions of Ag^{111}, Zr $OHP^{32}O_4$, and Y^{90} silicate, as well as Tc^{99} generator, a new facility is at present being planned for regular production of these materials, profiting of the experience of the present designs. A wide programme for production of a variety of unprocessed isotopes and radiation sources as well as of labelled compounds is under consideration.

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*a) Many engineers and radiochemists, whose names will be mentioned in the text of the main report, have contributed graciously in various lines at different stages.

b) Engineers Axelsen and Hoye represented NORATOM in erection and testing.